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The Claremont Colleges started the first US cluster experiment in 1925. Through the cluster concept, the personal values of the small college have been preserved while it secured facilities of the university. What is not known is whether educational resources have been enriched at a faster rate than the rise in unit cost. The purpose of this study was to examine the assumption that certain offices or services operate more economically on a central basis in cluster colleges than the same offices or functions in individual non-cooperating colleges. Eighteen individual colleges were selected for comparison with 4 of the 5 Claremont Colleges on enrollment, annual expenditures, academic reputation, selectivity, faculty compensation level, assets, endowment, tuition, sex, and curricular emphasis. Findings reveal that in some areas --library, business office, and health services --there are advantages such as cost benefits and increased resources in a central operation. These profits are gained because the individual small colleges have the size advantage of the group which permits unit costs to decrease at lower enrollment levels. Individual independent colleges, large or small, receive only what they can individually support. For the other areas studied, sufficient data were not available to determine any advantage to cluster or non-cluster colleges. (WM)

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FINANCIAL ASPECTS
of
INTERINSTITUTIONAL COOPERATION:
UNIT COSTS IN
CLUSTER AND NON-CLUSTER COLLEGES

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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THE CLAREMONT COLLEGES

June 1968

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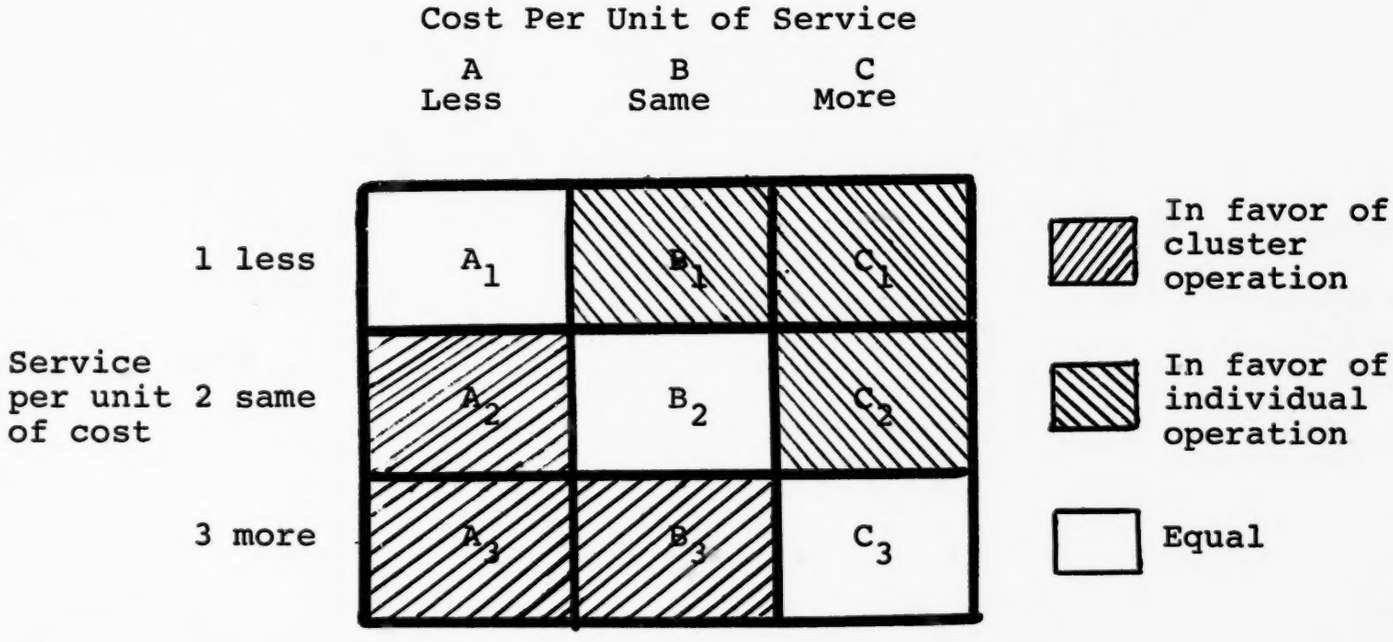
Introduction and Statement of the Problem

In 1925 the Claremont Colleges started the first cluster college experiment in this country. Through the cluster concept, the Claremont Colleges have attempted to preserve the personal values of the small college while securing the facilities of the university and to enrich educational resources at a faster rate than the rise in unit cost. The cluster concept has achieved the first of these objectives, but we do not know the cost. As Harris points out, "Part of the failure to pay more attention to college costs is due to a widespread view that the measurement of these costs is impossible."1 Yet, these costs must be identified. It is extremely important for a college to make sure that the most is being gained from each dollar spent.

Cost comparisons should be useful to all colleges, and since some cluster groups are now being proposed for reasons of economy, the Claremont Colleges should be a logical choice for comparison of costs of certain of their facilities or functions which operate on a cooperative or central basis within the cluster to the costs of similar functions in individual independent colleges, i.e. those which are not part of a cluster or group of cooperating colleges.

One could represent the relationship between costs and services in the following way.



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1 Seymour E. Harris, Higher Education: Resources and Finance, (New York, 1962, McGraw-Hill,)p. 502.

The assumption being examined is that certain cluster college operations are more economical than individual college operations and should therefore fall into categories A2 (Less cost for the same services) A3 (Less cost for more services) or B3 (Same cost for more services). Categories B1, C1 and C2 would represent cost or service disadvantages and the diagonal A1, B2, C3 would show no advantage either way assuming that the less or more services are paralleled by equivalent less or more costs, i.e. a constant per-unit reduction or increase.

In the Claremont group there are five undergraduate colleges (Pomona, Scripps, Claremont Men's, Harvey Mudd and Pitzer) and the Claremont Graduate School. Four of the colleges were included in the current study. Pitzer, a women's college, admitted its first students in 1964 and no comparable group of independent colleges could be found for comparison purposes. Claremont Graduate School was not included because it is quite different organizationally from most graduate schools and because, it did not, for the period covered by the study, participate in all the cooperative functions studied. When information is presented concerning the Claremont Colleges as a group, however, data for Pitzer and the Graduate School are included.

Method and Procedure

A list of colleges was compiled for comparison with each of the four Claremont Colleges to be included in the study. Factors considered were enrollment, annual expenditures, academic reputation, selectivity, faculty compensation level, assets, endowment, tuition, sex and curricular emphasis.

For Pomona, coeducational liberal arts colleges were used, for Scripps, women's colleges, for Claremont Men's College, men's colleges and for Harvey Mudd, colleges of science and engineering. Dartmouth was used as a comparison college for the Claremont Colleges as a group. Clearly, no two colleges will be completely comparable on all the variables mentioned above. An attempt was made to match colleges as closely as possible on the variables involved.

From an initial list of approximately 50 colleges, 18 were finally selected for use in the study. The most difficult selection was for Harvey Mudd College and only two colleges were chosen for comparison purposes. For each of the other Claremont Colleges, 5 colleges were chosen for the comparison group. The colleges in each group are listed on the following page.

Claremont Colleges	Colleges in Comparison Group
Claremont Men's	Hamilton Haverford Kenyon Wabash Washington and Jefferson
Harvey Mudd	Cooper Union Rose Polytechnic
Pomona	Colorado Knox Occidental Reed Swarthmore
Scripps	Barnard Bennington Chatham Goucher Mills
The Claremont Colleges (as a group)	Dartmouth

For discussion purposes, the colleges in the comparison group for Pomona will be referred to as "Coeducational Colleges," those for Scripps as "Women's Colleges", for Claremont Men's (CMC), as "Men's Colleges" and for Harvey Mudd (HMC), as "Engineering Colleges". "The Claremont Colleges" (CCs) refers to all 5 undergraduate colleges plus the Claremont Graduate School.

There are 19 areas of cooperation in which all 6 Claremont Colleges participate. There are 16 other areas in which 2 or more colleges are involved. Only the following areas of interinstitutional cooperation currently existing among the Claremont Colleges were selected to be studied.

1. Library
2. Business Office
3. Health Service
4. Psychological Clinic and Counseling Center
5. Office of Institutional Research
6. Telephone Service
7. Maintenance and Repair

This study does not, therefore, propose to review the total operations of the various colleges, but rather to spot-check certain features of cooperative and non-cooperative ventures, the principle concern being with the financial aspects of the chosen operations. Attempts will be made to measure both costs and services, but no judgment of the quality of the services received at the infirmary nor of the quality of the holdings of or services

rendered through the library will be made, for example, although some judgments of this general type were implicit in the selection of the institutions to be included in the study.

In order to make initial comparisons of the areas listed above, financial reports of all the colleges in the study were obtained. Anyone who has dealt with college annual financial reports will probably agree with McGeorge Bundy who said:

> Even on relatively straightforward questions of financial reporting, most of us are still remarkably reticent. The annual financial report of the average institution of higher learning is comprehensible only to its writer, if to him. Let me emphasize here with all the force I can that I charge no one with fraud or even with negligence. The reaons for the deficiencies in our accounting are many, but in my judgment they do not include weakness of mind or conscience among our administrators. They are more subtle and more difficult than that. ....Above all -- and I think this is my central point -- complexity is no excuse for obscurity. The educational meaning of our financial facts and figures may sometimes be arbitrary or indeterminate, but the facts and figures exist and they need to be more openly and fully reported than they are.2

Because of the intricacies of financial reporting, the chief financial officer of each college in the study was contacted in order to secure his cooperation. In every case, the willingness to participate met or exceeded expectations.

After the financial reports had been received and initial comparisons made, each college was visited by one of the investigators to go over the data with the chief financial officer and to discuss appropriate areas under study with other college staff members as required.

The decision concerning the specific functions or activities to include in each category (library, health service, etc.) was reached after much discussion with these persons. Their judgment of the best way to distribute costs in each case for their own college, based on the distribution of personnel time and the functions performed by individuals and offices, identified costs more accurately than otherwise would have been possible. A pilot study of the analysis of expenditures of medical education at Emory University concludes,

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2 McGeorge Bundy, speech delivered to the American Council on Education, (Washington, D.C., Oct. 13, 1967)

> Cost analysis, no matter what system is used, is not an exact science but, rather like medicine, an art based upon a science....Judgment must be used in such matters as determining how to distribute each overhead cost most equitably and develop the best estimates for the distribution of personnel time, determining where the exceptions to the established rules are justified, or perhaps in considering the relationship of the purpose of an expenditure to the method of distribution. Obviously, these judgments must be based upon a familiarity with the general philosophy of the enterprise under study. These judgments should be supported by reason, and reason, of course, is frequently debatable.3

All of the comparisons in this study are based on a three year average (1964-5, 1965-6, 1966-7) unless otherwise noted. For unit comparisons, e.g., library volumes per student or cost of health service per student, the averages for the comparison groups were computed in two ways. Take, as an example, number of library volumes per student (V/S). The first method used the three year average (V/S) for each college. These averages were then used to get an overall average for the group. This method weights each college equally. The other method divided the total number of volumes for the comparison group by the total number of students in the group. This method gives more weight to, in this case, those colleges with more students.

In this report, unless otherwise indicated, all of the results presented are those computed by the latter method in order to allow weight to be given to the factor measured in proportion to its relative size in the overall comparison group. These two methods, however, did not produce markedly different results partially because of the initial selection procedures.

In some comparisons, if data were not available for three years, estimates were used if they could be made reliably. If data were unavailable or there was no way to get a reliable estimate or costs could not be allocated accurately, that college or group was omitted from the comparison. In some cases data for the individual Claremont Colleges are shown. Where costs or services are the same for each college, or where records are not separated by college, only the information for the Claremont Colleges as a group is shown.

For each area studied an attempt was made to identify meaningful cost and service (or resources) measures. For three areas (**Library**, Business Office, Health Services) most of the informa-

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3 Cited in Harris, pp. 502-503

ation sought was available. For two areas (Psychological Clinic and Counseling Center and Maintenance and Repair) some information was available. For the other two areas (Institutional Research and Telephone) virtually no information was available. Only two of the colleges in the comparison groups had offices of institutional research and therefore results for this area are not included in the study.

Discussion and Results

Each area included in the study will be considered separately. A description of the costs for each area is given as well as a description of the duties, services or resources related to those costs.

Library

Library costs can be divided generally into two categories, 1) those concerned with the operation of the library and 2) those allocated directly for book purchases. When referring to 1) above we will use the word "cost" and when referring to 2) we will use the phrase, "expenditures for books". Cost of operation of the library includes all salaries and fringe benefits, supplies and expense but does not include grounds expenses, building maintenance, amortization or utilities.

The cost per student in the comparison colleges decreases as the size of the student body increases, at least up to about one thousand. The trend then reverses and moves upward to the Coed Colleges and to Dartmouth (Figure 1).

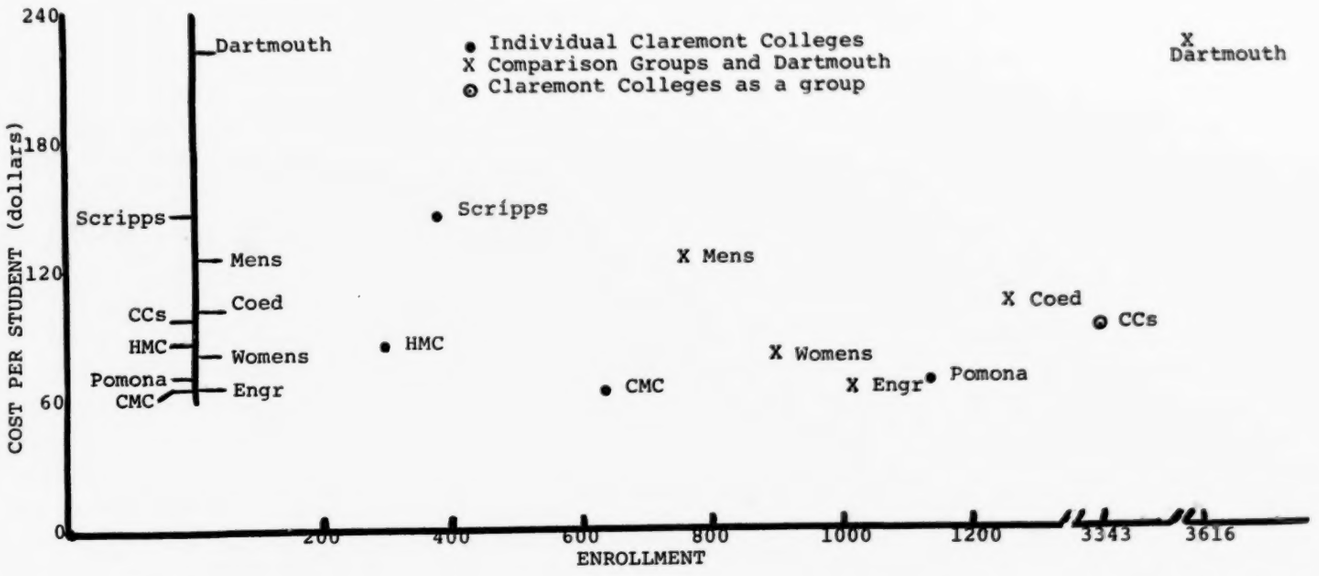

Fig. 1. Cost of operation of the library per student plotted against enrollment

Among the Claremont Colleges, Harvey Mudd shows a high cost per student partially because of the relatively small enrollment. Scripps College's high cost results from the Denison Library, which is a separate library owned and paid for entirely by Scripps.

The cost per student for the operation of the library for the Claremont Colleges is $97. This cost is below two of the four comparison groups, the one with the smallest enrollment (Men's) and the one with the largest enrollment (Coed).

The display on the left side of Figure 1 results from projecting the cost per student values to the left so that the relative positions of the colleges and groups can be more easily seen. All Claremont Colleges are shown to the left of the vertical line and comparison groups are shown to the right. The symbols ●, X and ⊙ will be used throughout for identifying the various colleges and groups but the legend will not be repeated on subsequent figures.

In terms of resources and services, what is available for the costs referred to above? One measure of the resources available to the students is Volumes per Student (books, micro editions, bound journals and serials, excluding documents). For services available we have chosen three that can be measured fairly objectively; Volumes Circulated per Student, Interlibrary Loans per Student and Hours the Library is Open per Year.

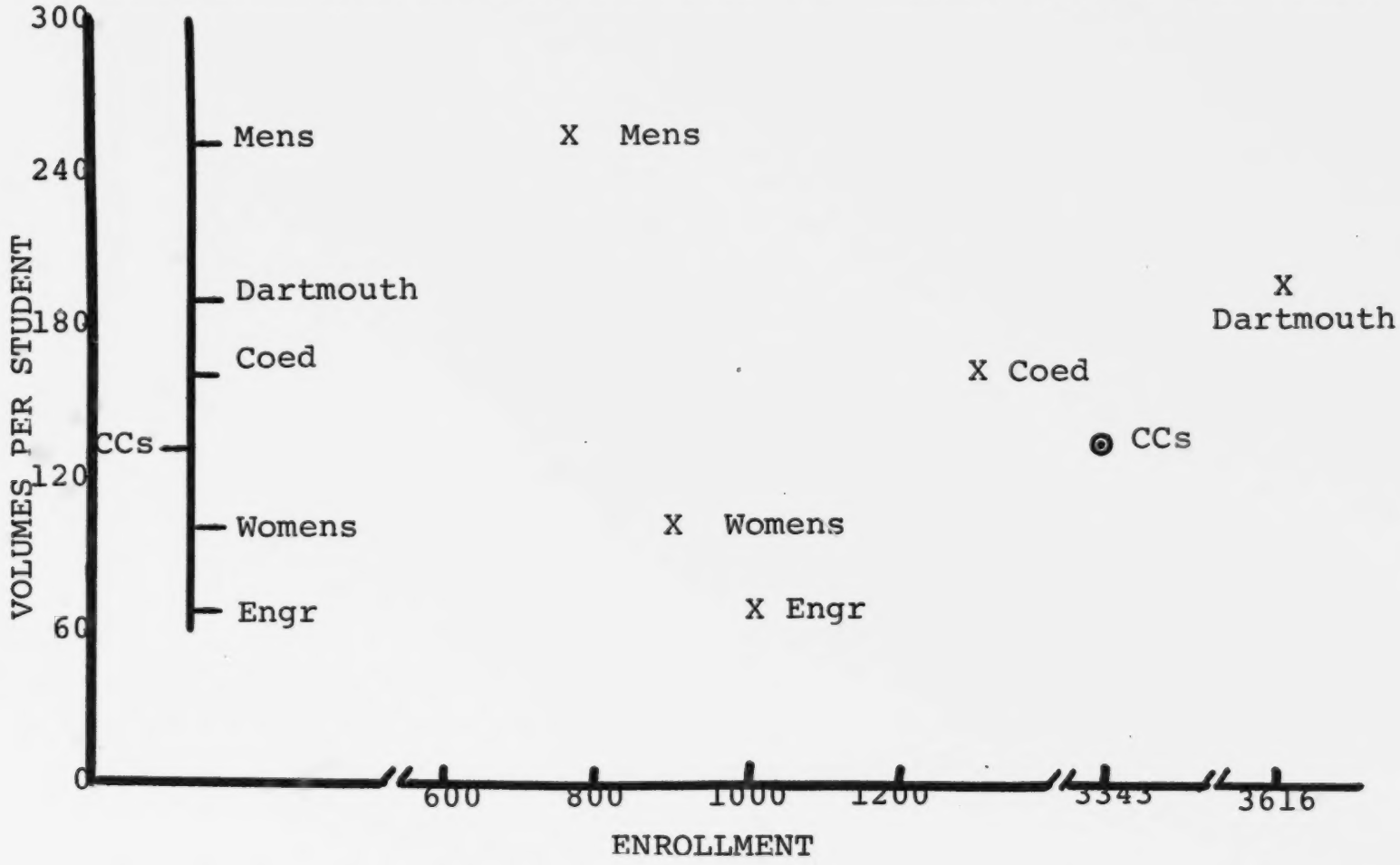

Fig. 2. Number of volumes per student plotted against enrollment

Figure 2 shows the number of volumes per student. The same pattern for the outside comparison groups is noted as in the cost of operation per student.

When cost per student is plotted against volumes per student (Figure 3) a very strong positive relationship is seen; the greater costs are accompanied by more resources available to the students. Dartmouth's costs are proportionately higher than the other colleges'.

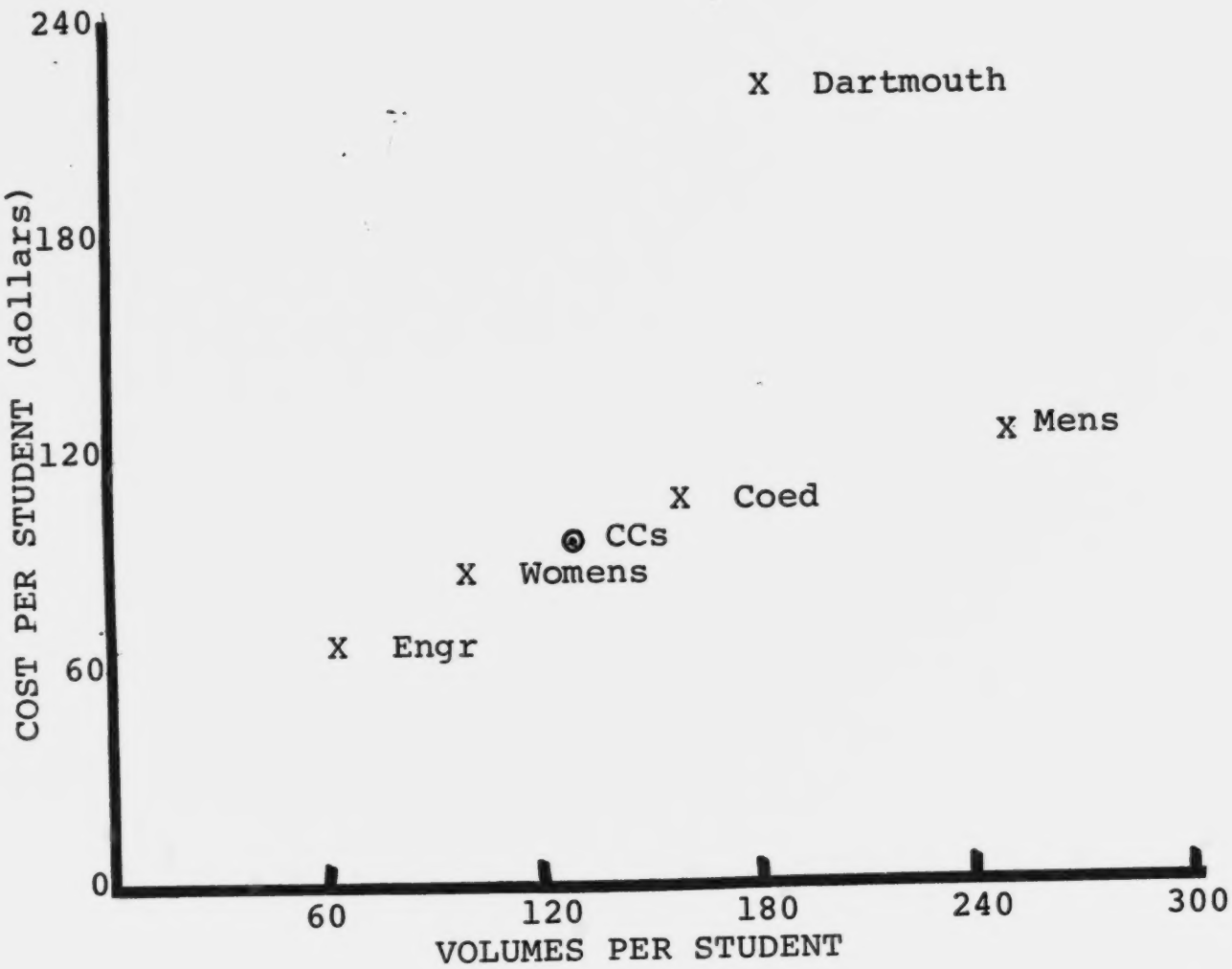

Fig. 3. Cost of operation of library per student plotted against number of volumes per student

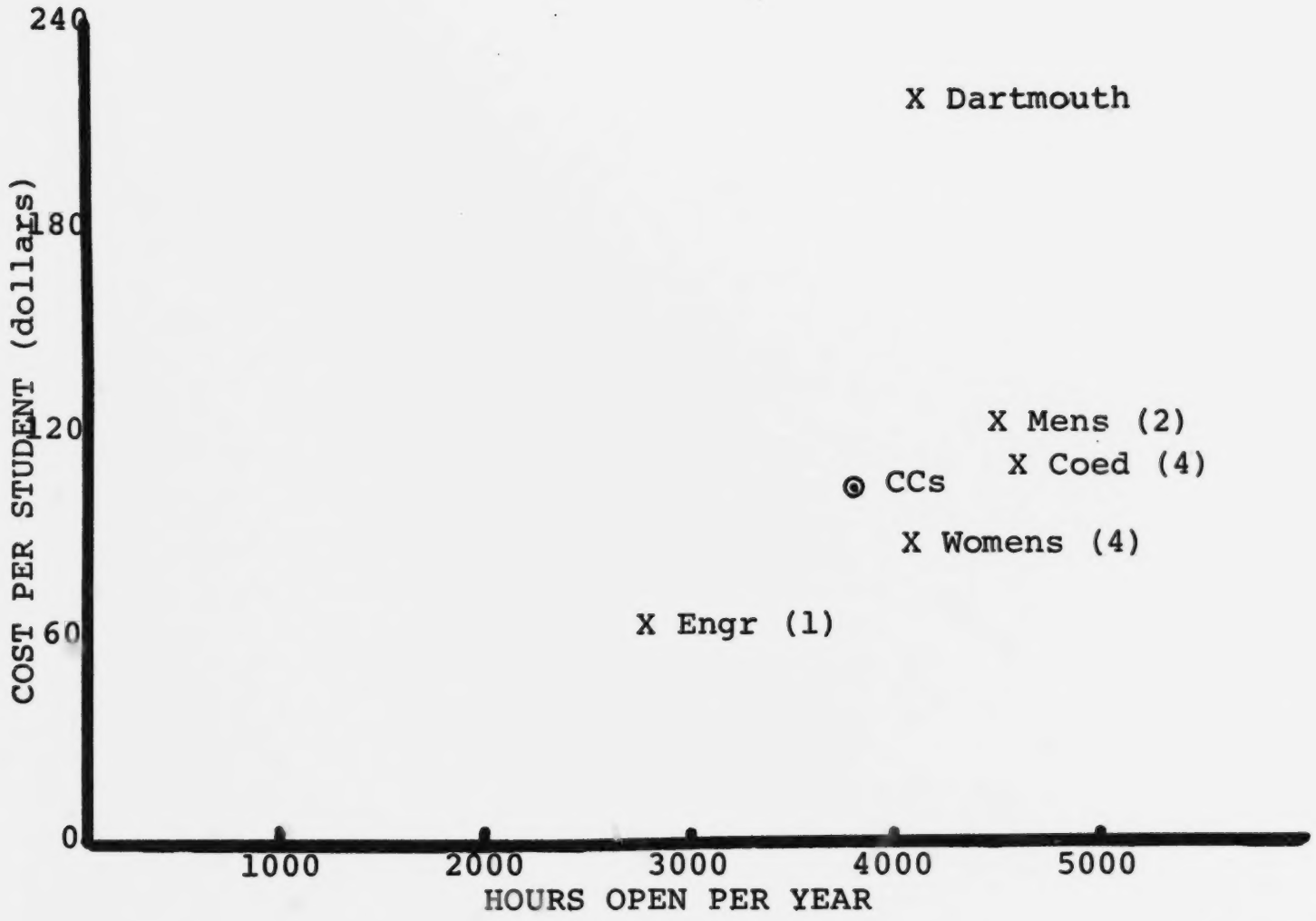

Fig. 4. Cost of operation of library per student plotted against number of hours library is open per year

Figure 4 shows that higher costs are also generally associated with more service in terms of hours the library is open each year. The numerals in parentheses indicate the number of colleges for which data were available, e.g., data for only 4 of the 5 Coed Colleges were available.

Figure 5 shows no relationship between cost and number of volumes circulated per student. We could reasonably expect a relationship between the two since number of volumes circulated per student would be a service measure, i.e. reflect activity level for the library staff. However, the number of volumes circulated will be determined by a number of factors, such as adequacy of reading rooms in the library, circulation policy, whether stacks are open or closed, reserve book policy, size and adequacy of the library collection, as well as nature of the student body. It should also be mentioned that no relationship was found between the number of volumes circulated per student and either the number of volumes per student or the number of students.

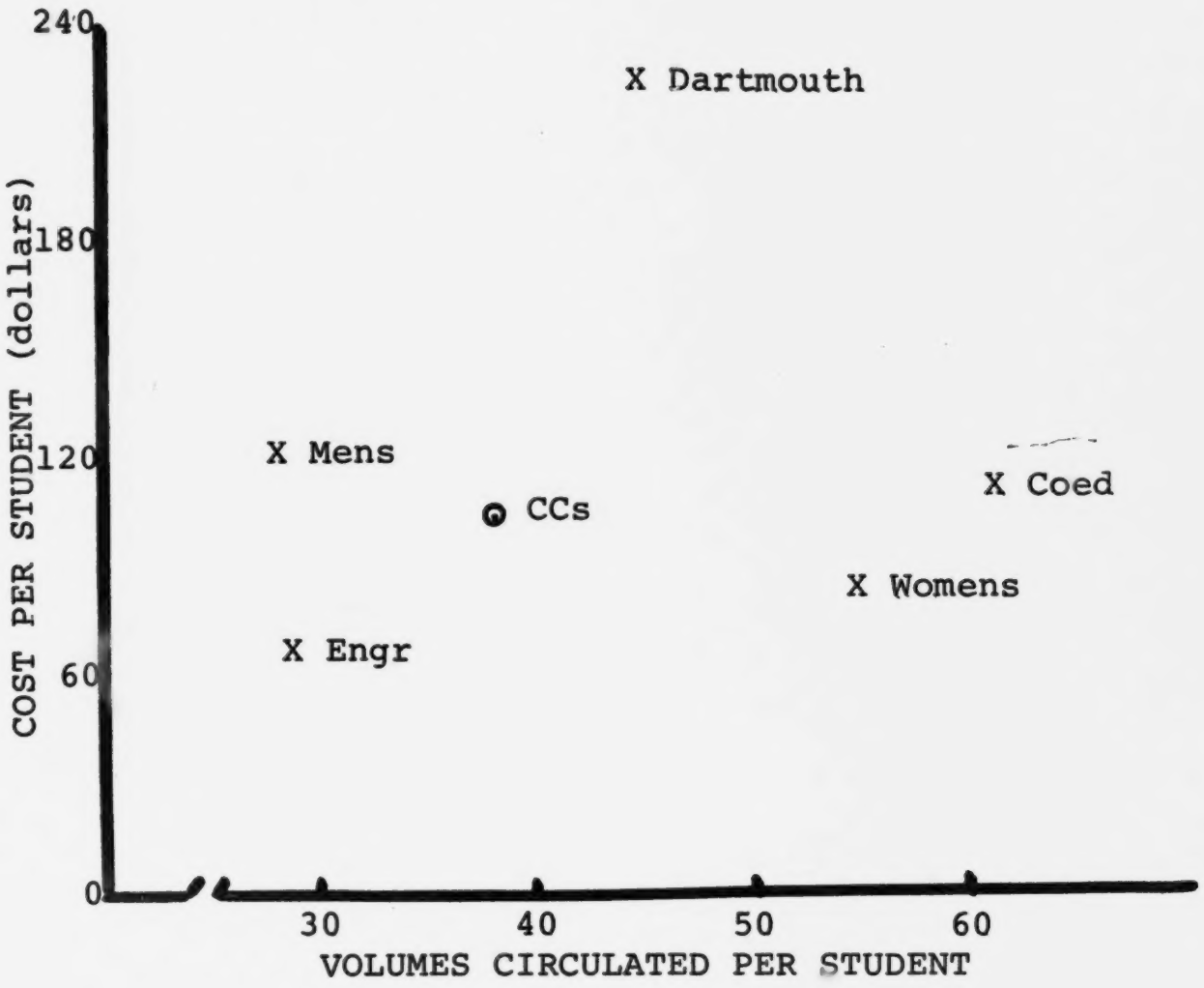

Fig. 5. Cost of operation of library per student plotted against number of volumes circulated per student

In the comparisons thus far, the Claremont Colleges have been at about the mid-point on cost per student as well as on the variables of volumes per student, volumes circulated per student and hours open per year.

Turning now from the cost of operation of the library to expenditures for books, Figure 6 shows decreasing per student expenditures as enrollment increases up beyond 1000, then a reversal of the trend. It is interesting to note that the expenditures for books per student exactly parallels the measure of total number of volumes in the collection of the college or group of colleges represented. For example, Dartmouth has the largest collection. The Claremont Colleges have the second largest library collection, followed by the Coed Colleges, Men's Colleges, Women's Colleges and Engineering Colleges, in that order. Therefore we see that current practices, i.e., expenditures for books over the most recent three year period, accurately identifies the relative size of the total library collection. This relationship of course, does not necessarily have to be the case and it is surprising that it holds, given the different ages of the various colleges involved in the study.

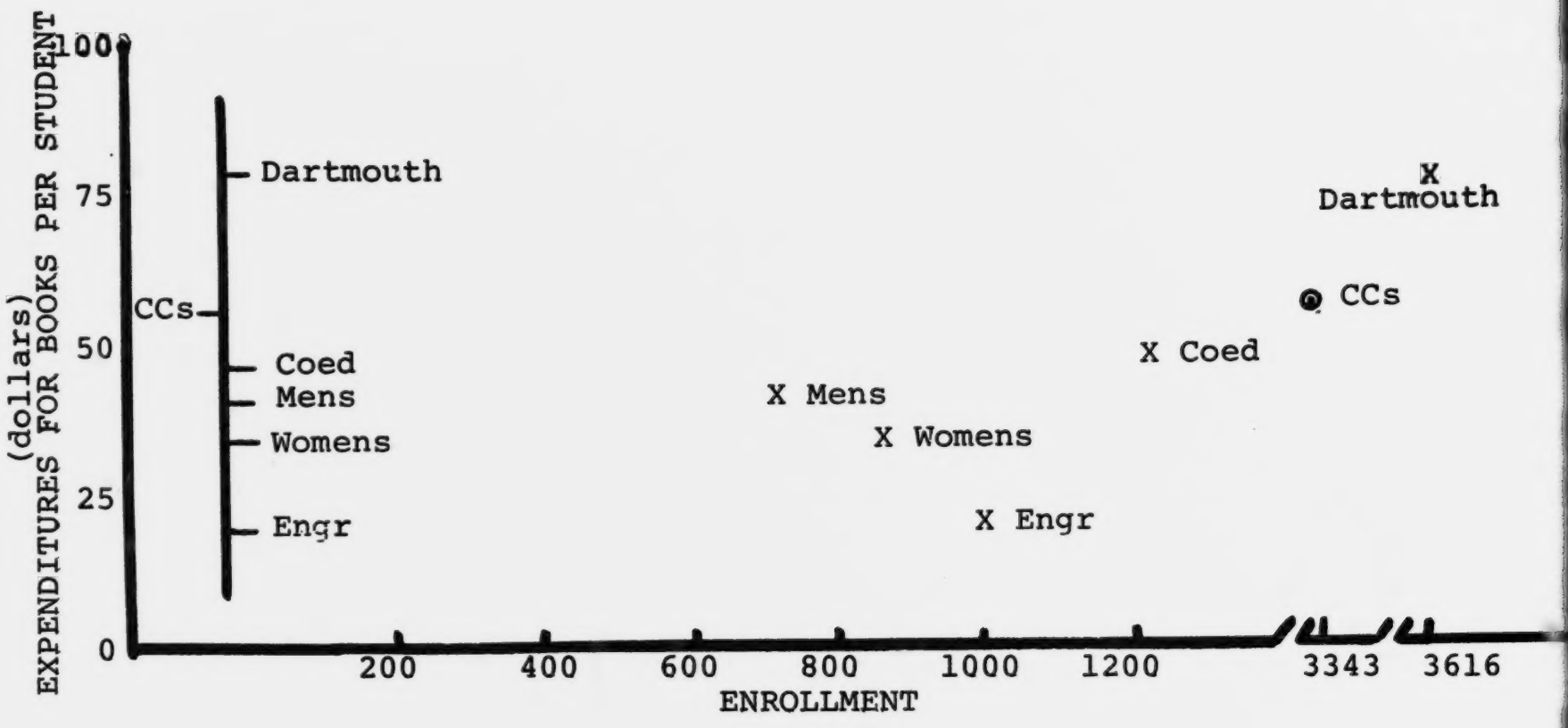

Fig. 6. Expenditures for books per student plotted against enrollment

TABLE 1

Relative Position of the Claremont Colleges as a Group and Comparison Colleges on Library Measures

	Highest				Lowest	
1. Cost per student	DRT	MEN	COED	CC's	WOMEN	ENGR
2. Volumes per student	MEN	DRT	COED	CC's	WOMEN	ENGR
3. Expenditures for books per student	DRT	CC's	COED	MEN	WOMEN	ENGR
4. Number of Volumes	DRT	CC's	COED	MEN	WOMEN	ENGR
5. Cost of operation	DRT	CC's	COED	MEN	WOMEN	ENGR
6. Expenditures for Books	DRT	CC's	COED	WOMEN	MEN	ENGR
7. Number of Interlibrary loans per student	DRT	MEN	COED	CC's	WOMEN	*
8. Hours Library open per year	COED	MEN	DRT	WOMEN	CC's	ENGR
9. Volumes Circulated per student	COED	WOMEN	DRT	CC's	ENGR	MEN

* Insufficient information for Engr. Colleges

In terms of cost, the Claremont Colleges as a group, have no advantage that a university or a college the same size as the total group, would not have, i.e., they fall in line in the expected places for both costs and services.

Considering the individual colleges, Scripps and HMC show higher per student costs than their comparison groups but also have only one half and one third the enrollment, respectively. Pomona and CMC are slightly smaller than their comparison groups, but show less per student costs.

If the points for the comparison colleges were joined, on Figure 1, Scripps, HMC and CMC would fall well below the line showing costs of operation in relation to enrollment. Since each college in the cluster derives some advantage of size from the group, per student costs decrease at lower enrollment levels for the individual cluster colleges.

In Table 1 the per student costs and overall costs tend to parallel pretty well the measures of resources and services, showing generally that "you get what you pay for." From the point of view of each individual college in the cluster, however, it is at the service level of the group for the per student cost of the group, thereby achieving a cost advantage compared to individual operation.

A word should be said about the increase in per student costs when colleges exceed a certain size. Again looking at Figure 1, the per student costs are seen to increase when enrollment exceeds 1000 to 1100 approximately. Perhaps when libraries reach a certain size increasing emphasis is placed on special collections, rare books and out-of-print editions. This would increase the cost of book purchases per volume while lowering the volumes per student and very likely increasing the cost per student. This same type of reversal of cost per student for the larger colleges will be noted in some of the other areas studied.

Business Office

The Business Office for the Claremont Colleges charges for services on the basis of a formula which weights equally, total assets, endowment, tuition and fees income and total annual expenditures of the colleges involved. These items, which overlap considerably, are believed by the presidents and treasurer to represent fairly accurately, the costs incurred by the business office for handling the financial affairs of each college. The amounts of these four items are added together for each college and that total as a percent of the totals of all the colleges, represents the individual college's share of the business office expense (with some slight modifications for various types of trust deed loans). The amount paid by each Claremont College was considered in this study to be the cost of operation of the business office for that college.

For all colleges included in this study the same four factors were used to compute "dollars handled." Because of the overlap of the categories, the amounts listed as "dollars handled" are of course larger in every case than the actual dollars handled by the respective business offices. For the same reason, the "cost per thousand dollars handled" will be lower than actual in each case. Therefore, the dollar amounts per se are not important but rather the relative positions of the colleges.

The functions on which cost of operation of the business offices was based are as follows: personnel processing and records, payroll, bursar (including student payments, scholarships, loans, tuition, fees, gifts, group insurance and TIAA), general accounting, budget control, treasurer's office (investment administration, annuities, life income and endowment). Costs of maintenance, amortization and utilities have been excluded.

Figure 7 shows how much it costs for the operation of the business office for each thousand dollars handled.

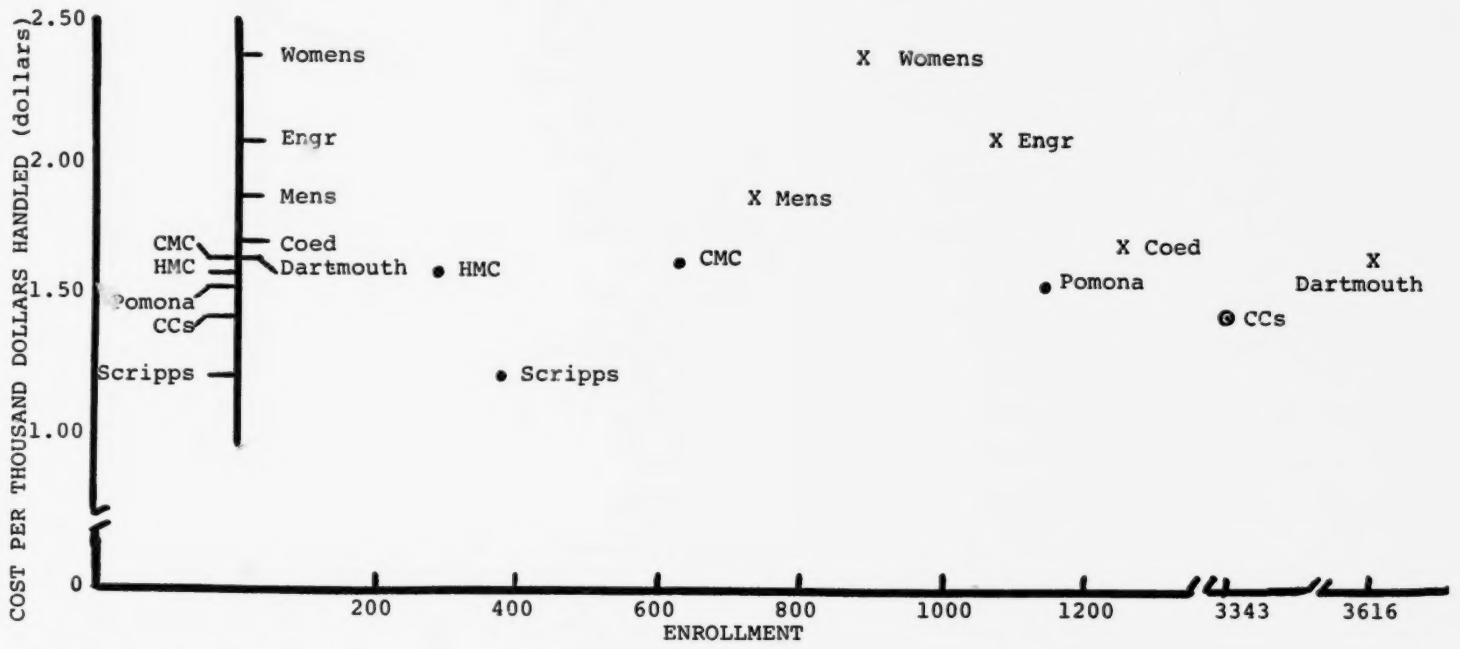

Fig. 7. Cost of operation of the business office per thousand dollars handled plotted against enrollment

Except for the Men's Colleges, the comparison groups show decreasing unit costs as enrollment increases. When the cost per thousand dollars handled is plotted against total dollars handled (Figure 8) all of the comparison colleges fall into a pattern of decreasing unit costs with increasing volume of money handled. It seems that activity level or dollars handled is closely associated with cost, i.e., the size or volume in terms of dollars handled is more important than the size of the college in terms of enrollment.

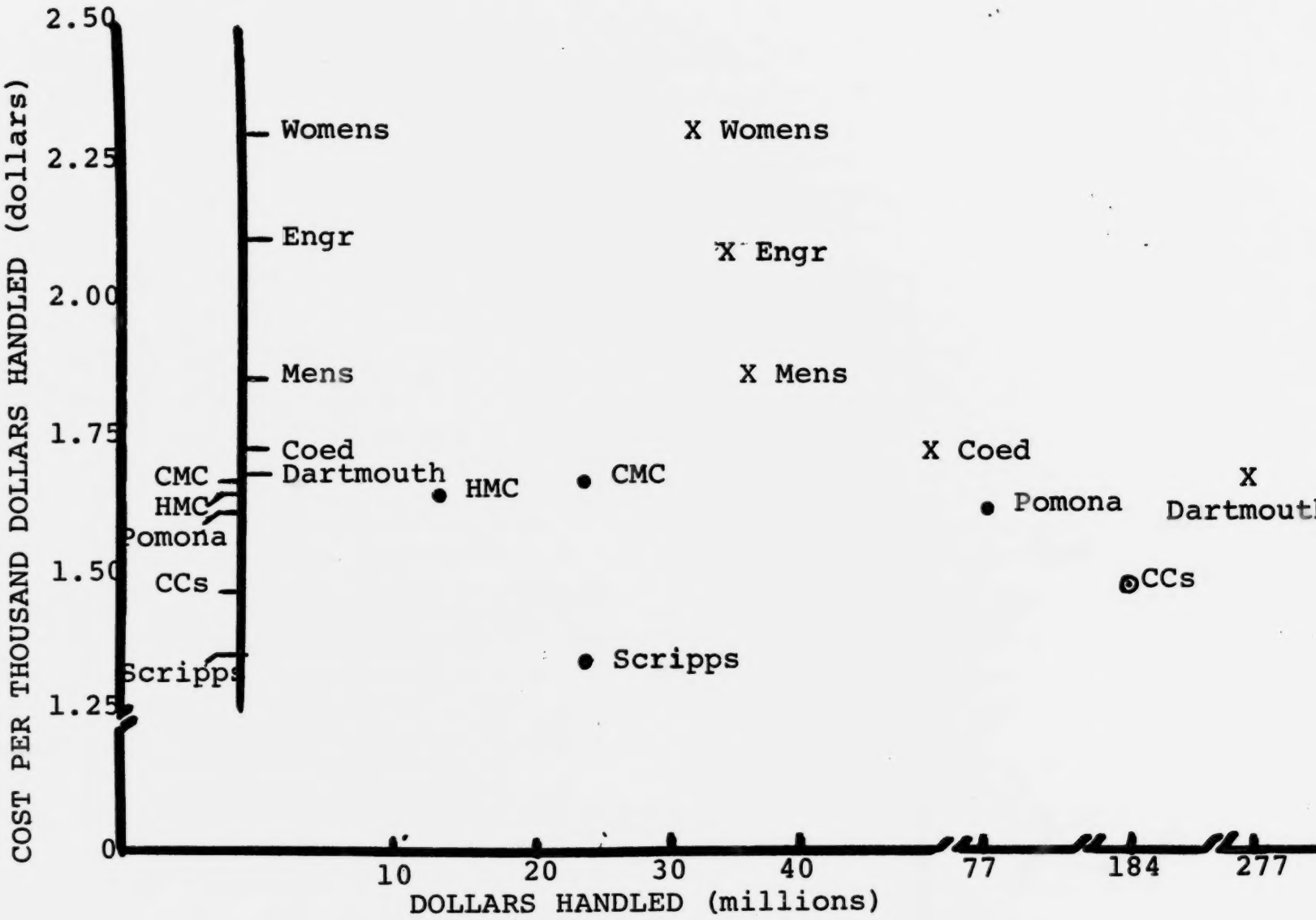

Fig. 8. Cost of operation of the business office per thousand dolla handled plotted against total dollars handled

Three of the four Claremont Colleges show essentially the same costs, with Scripps being lower than the others. The costs for these colleges should be quite similar since all are charged on the basis of dollars handled, as mentioned before, with some differential charges for handling trust deed loans.

Each Claremont College and therefore, the Claremont Colleges as a group, show lower costs than any of the comparison groups. Three of the four are quite low in terms of dollars handled, but this does not get translated into high costs, probably because they are part of a larger business operation.

There may be some reason to examine the rationale for the method of computing charges for business office services within the Claremont Colleges (e.g., "Does it really cost as much to handle $1000. of endowment as it does to handle $1000. of tuition and fees?") but, overall the central operation appears to have a financial advantage over the individually operated college business office.

Health Services

Since there are no health services at Cooper Union, the HMC-Engineering group has been omitted from these comparisons. At the Claremont Colleges, records of treatment are not separated by the college of the student and therefore information concerning the individual colleges is not shown, but only that for the group.

The cost of the health services includes all salaries and fringe benefits, equipment, office and medical supplies and expense but excludes maintenance, amortization and utilities. The cost per student varies only slightly among the various groups in the study (Figure 9). The Coed colleges and Claremont Colleges are the two larger of the four groups and have the lower unit costs.

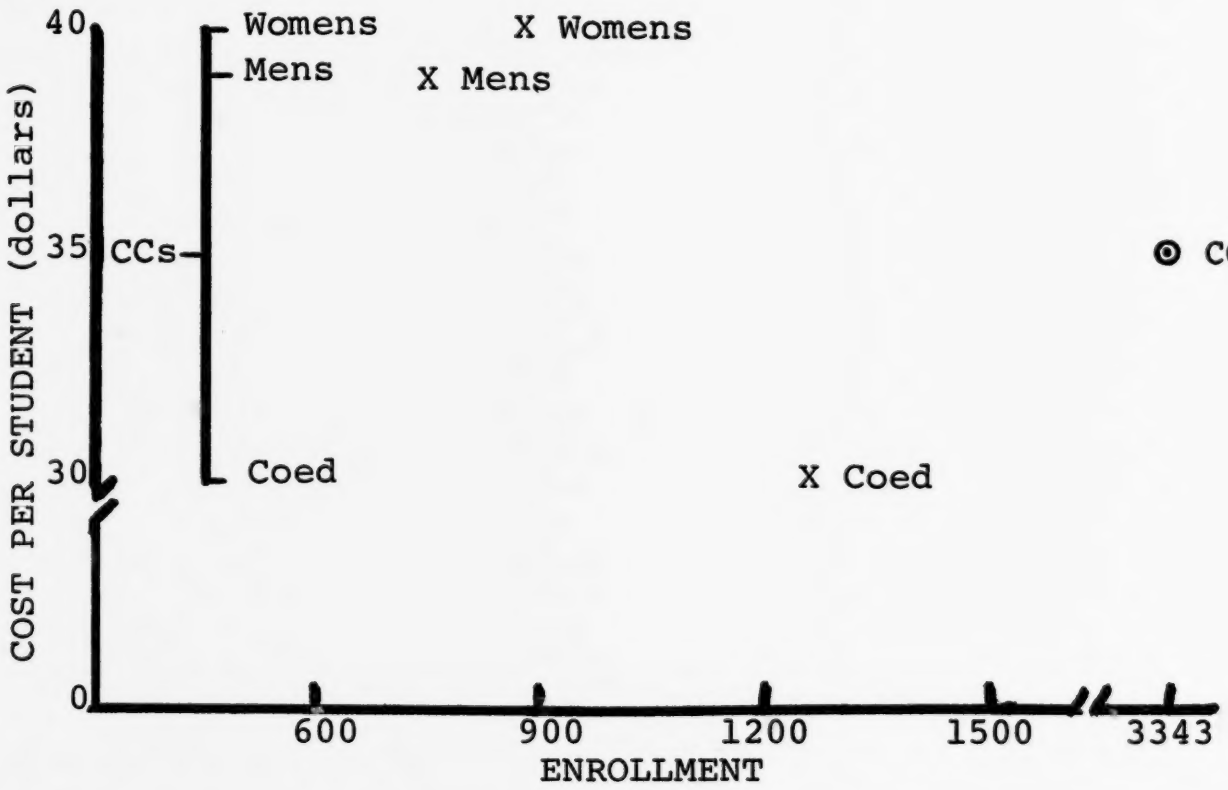

Fig. 9 Cost of operation of health services per student plotted against enrollment

As the service measure, the availability of doctors during the year, i.e., total doctor duty hours per student, was used. This is the total number of hours all doctors were on duty during the academic year (36) weeks, divided by the number of students. One might expect the Coed colleges and Claremont Colleges to have the lowest ratio by this measure to correspond with the lower unit costs, but only the Coed colleges are noticeably low in this regard (Figure 10). The doctor duty hours per student range from .25 hours for the Coed colleges to .71 for Men's colleges, .90 for the Claremont Colleges and .95 for Women's colleges. Typically, the health services of the colleges in this study were manned

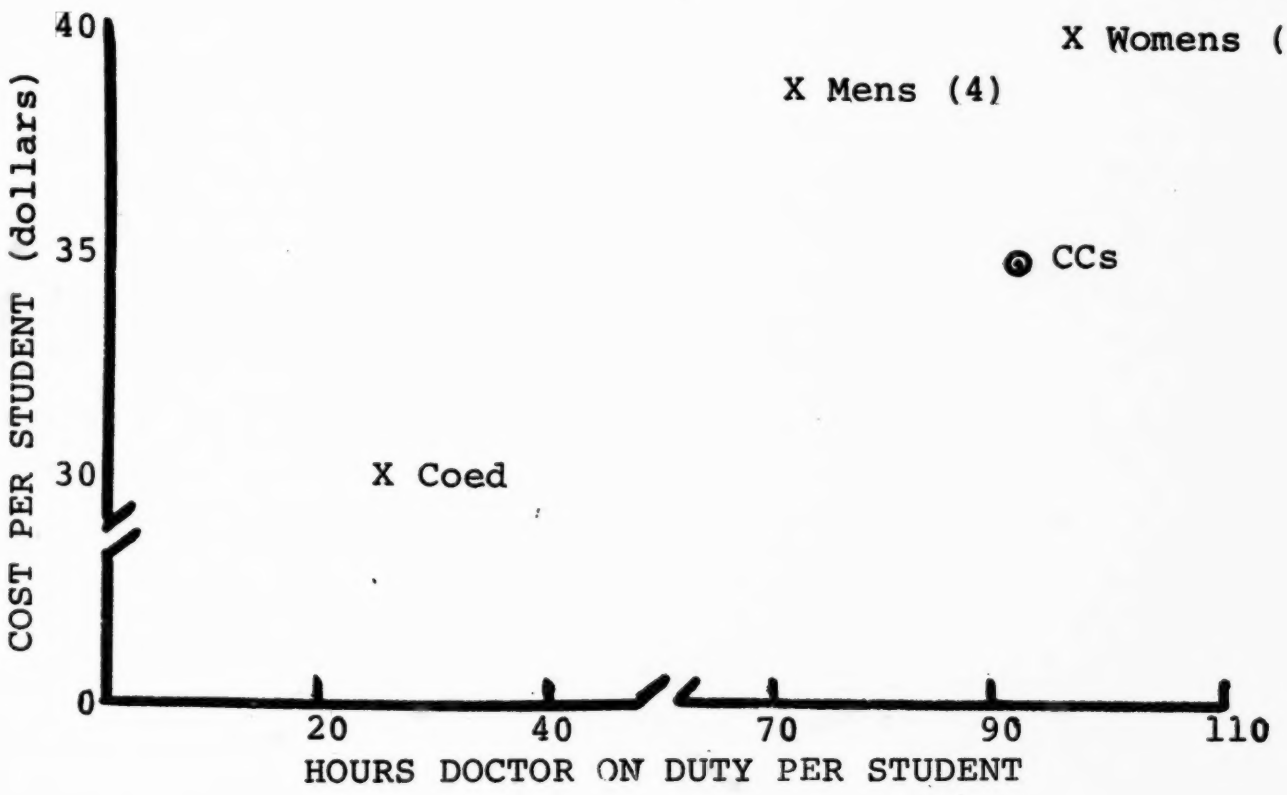

Fig. 10. Cost of operation of health services per student plotted against number of hours doctors are on duty per student

by part-time doctors, who spent two to three hours per day, five days per week on the college campus, during which time they treated out-patients and made infirmary rounds. The doctors were on call 24 hours per day, seven days per week. There was, however, considerable variation in the staffing of the health services, a situation generally reflected in the cost per student figures.

A measure of the use of the health services is number of visits per student. This ranges from 4.9 at the Claremont Colleges through 5.2 for Women's Colleges and 5.4 for Men's Colleges to 6.3 for the Coed Colleges. The high number of visits per student for the Coed Colleges, coupled with the low doctor duty hours per student indicates that the doctor duty hours per visit would be quite low and suggests that in these colleges proportionately more of the visits are handled by the nurses.

The cost per visit to the health services varies from a low of $4.73 (Coed colleges) to $6.46 (Claremont Colleges), $7.11 (Men's colleges) and $8.49 (Women's colleges). On this measure the colleges fall in the same order as on cost per student.

Students typically pay for health services on a per-student basis (health fee) rather than by the visit and on this basis (cost per student) the larger numbers (enrollment)

and lower unit costs go together. In the case of the Claremont Colleges this low cost is associated with high service in terms of doctor duty hours per student.

For health services then, it seems that a larger combined center does provide cost benefits.

Psychological Clinic and Counseling Center

Of the 18 comparison colleges in this study only 11 had psychological services. Seven of the nine colleges with enrollments over 1,000 had such services, but only four of the nine with enrollments under 1,000 had them. There was no relation between total enrollment and the amount of money spent for the services except that the Claremont Colleges and Dartmouth with by far the largest enrollments, spent considerably more for psychological services. The cost per student tended to decrease as enrollment increased up through 1250, with a reversal taking place for the Claremont Colleges and Dartmouth.

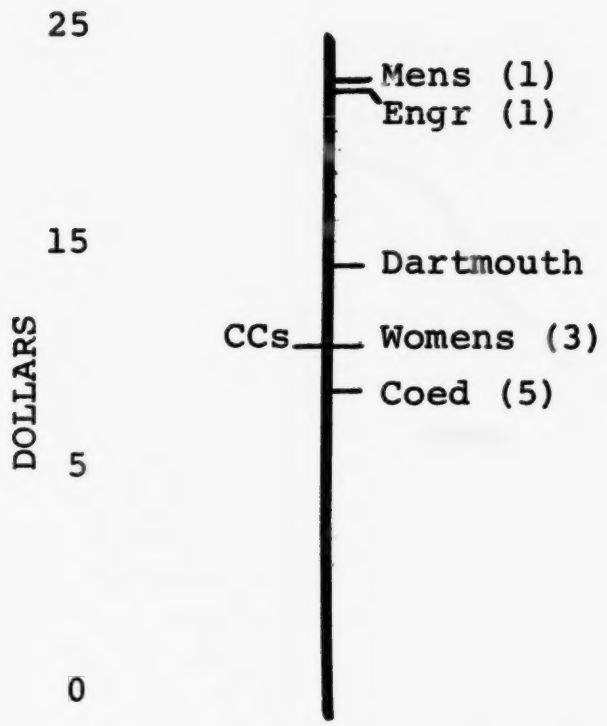

Fig. 11. Cost per student for Psychological Clinic and Counseling Center

Figure 11 shows that the cost per student ranges from $8.85 for the Coed Group to $23.00 for the one Men's College that has psychological services. Since the services available to students varied so much, no description of common elements is possible, but in general the services comprised academic and vocational counseling and testing. Costs were based on time and expense devoted to these functions.

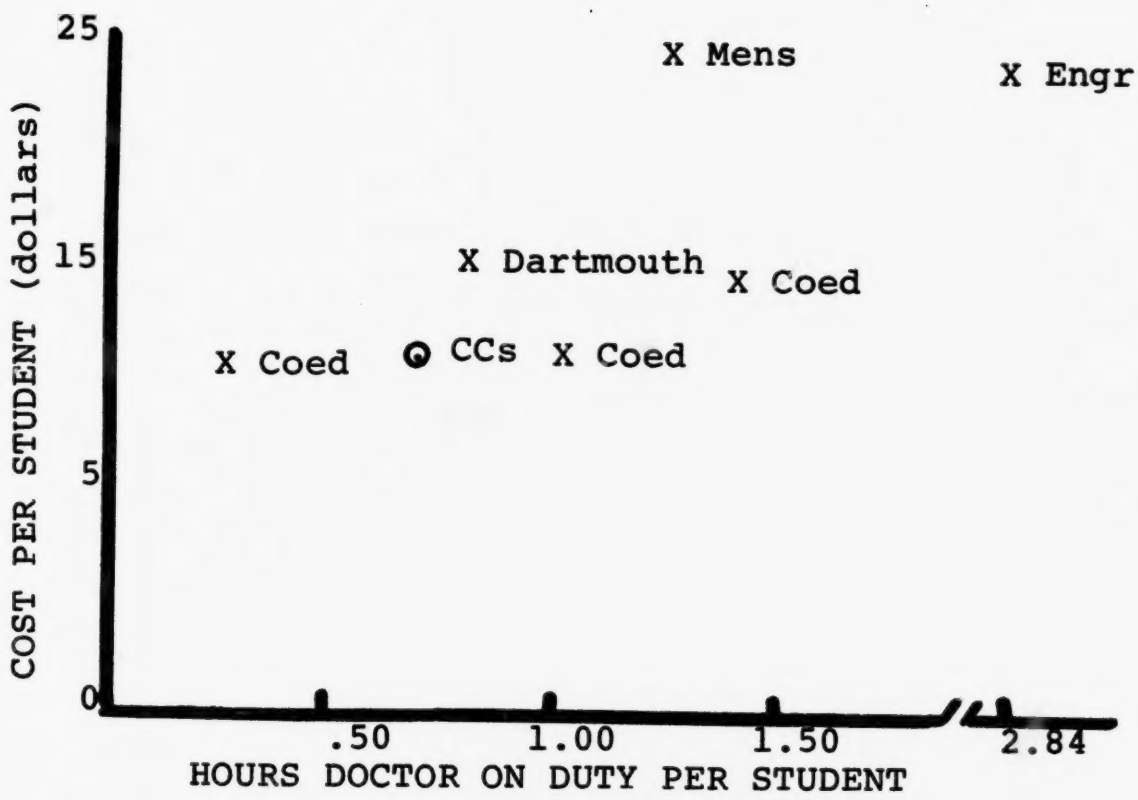

Fig. 12. Cost per student for psychological services plotted against number of hours doctors are on duty per student

Figure 12 compares the cost of psychological services with the number of hours the psychologists or psychiatrists were on duty. Each X on Figure 12 represents one college rather than a group and all colleges for which information was available are represented but not identified by name. More service in terms of doctor duty hours available is accompanied by higher cost.

Given the wide range of services available in the various colleges and the limited information concerning costs, no conclusions can be drawn regarding cost advantages to cluster or non-cluster colleges. Some speculation is possible however, based on the experience of the 18 comparison colleges. For example, it is unlikely that Harvey Mudd College, with less than 300 students, would have psychological services of any kind if it were not part of a cluster of colleges. Scripps and CMC would individually have about a 50% chance of having such services. Pomona as a separate, independent college very likely would have a psychological clinic and counseling center which would offer less services than are now available to the students and which would cost slightly less per student.

Maintenance and Repair

Some aspects of maintenance at the Claremont Colleges are not handled by or charged through the central operation, such as some grounds costs, taxes and insurance. For all practical purposes, however, this may be considered a central service of the colleges.

In this study, maintenance cost includes costs of contracted services, grounds and the security operation. It includes all salaries, fringe benefits, utilities and expense items but excludes campus rental property expense and building amortization.

For the Men's, Women's and Engineering colleges the trend is clearly a decrease in per student costs as enrollment increases. The Coeducational colleges and Dartmouth with the largest enrollments, show a reversal of the trend (Figure 13).

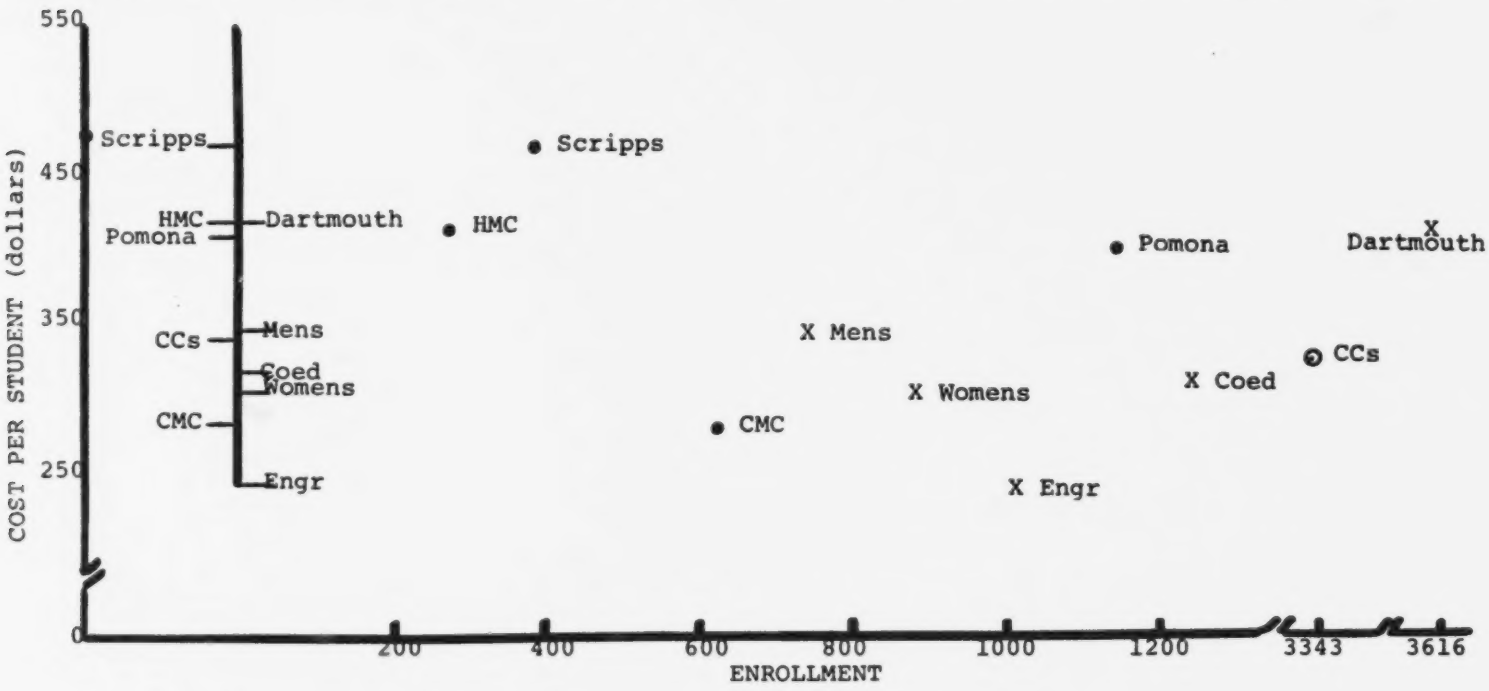

Fig. 13. Cost per student for maintenance plotted against enrollment

This is probably the result of larger colleges feeling the need for large auditoriums, campus centers and other facilities not usually found on smaller college campuses. As with some of the other areas studied, the unit costs increase when enrollment exceeds the 1100-1200 range. Dartmouth has the largest enrollment and the highest per student cost. The Claremont Colleges have the second highest enrollment and higher per student costs than three of the four comparison groups. Three of the four individual Claremont Colleges have higher per student costs than their comparison groups, yet, three of the four and the Claremont Colleges as a group show lower per student costs for their size than any of the comparison groups.

Although student body size may generally reflect the amount of maintenance activity to be carried out, it would be more accurate in this case, to relate maintenance costs directly to square footage of buildings maintained and number of acres maintained. Acreage figures were uniformly available but information concerning total square footage of college buildings maintained was, with few exceptions, unavailable. Acreage figures alone are not helpful since colleges that have approximately the same number of students and buildings vary considerably in acreage.

Concerning maintenance, there is insufficient information available to determine any cost advantage for cluster or non-cluster operation.

Telephone

As mentioned earlier, little information was available in this area. Costs were based on salary and fringe benefits of operators and charges for all rental equipment including switchboards and special lines. Building amortization, utilities and toll charges have been excluded.

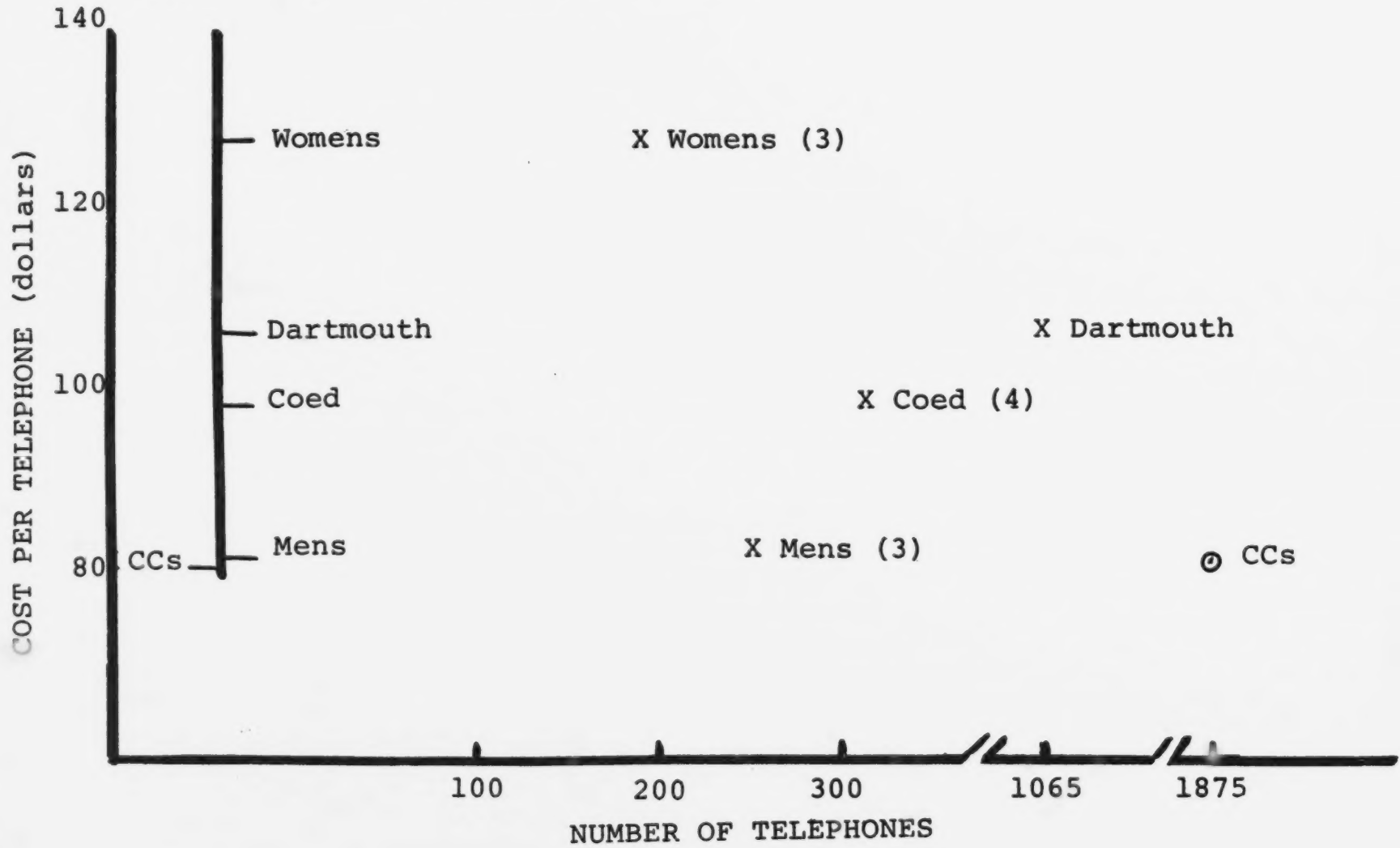

Fig. 14 Cost per telephone plotted against number of telephones

Figure 14 reveals no strong relationships between the number of telephones and cost per telephone. The three Women's Colleges for which data were available have the smallest number of telephones and the highest unit costs; the Claremont Colleges have the largest number of telephones and the lowest unit costs. However, so many factors enter into the cost and service considerations that comparing the number of telephones with cost per telephone is not meaningful. For example, as more telephones are added, the cost decreases for each one unless the system becomes more complex as when combinations of extensions and intercoms are added. This means that a small college with the simple telephone system may have a lower unit cost than a larger college, because of the complexity of most larger systems. In this case, then, the total number of telephones cannot be used as an accurate service measure unless it is coupled with information concerning the complexity of the system. Further, institutions vary considerably in the practice of providing telephones for students. This ranged from none in half of the comparison colleges to an estimated two-thirds of the total number of telephones in the Claremont Colleges. Since student phones are inexpensive compared to office telephones, increasing the number of student telephones lowers the unit cost. The Claremont Colleges do not separate student telephones from others for record keeping purposes and it was therefore not possible to compare information concerning non-student telephones across colleges.

Service measures involving the number of hours the switchboard was open per week or the number of telephones per user were confounded by some of the same factors mentioned above.

Summary and Conclusions

The purpose of this study was to examine the assumption that in cluster colleges certain offices or services operate more economically on a central basis than the same offices or functions in individual non-cooperating colleges. From the areas included in this study it appears that in some of them (library, business office, health services) there are advantages in a central operation. These advantages include cost benefits or economies, as well as increased resources. This latter advantage relates to greater resources in terms of quantity and/or variety of services available. For the other areas studied there was not enough information available to determine any advantage to the cluster or non-cluster colleges.

The advantages derived from the combined or central operation in the cluster college result from the individual small colleges having the size advantage of the group which permits unit costs to decrease at lower enrollment levels. Individual independent colleges, large or small, receive only what they can individually support.

This initial look at some of the operations of cluster and non-cluster colleges indicates that a much clearer picture of the operations of both types of colleges are needed. Definitions of services and the allocation of time and expenses to these services, of course, posed many problems. But, quite apart from this is the fact that in many instances, information was simply not available; information on which decisions should be based; information which is necessary for planning.

More extensive studies need to be conducted in this area to include more clusters of colleges, a wider range of independent (non-cluster) colleges, plus state and church-related institutions. We should also work toward the development of meaningful cost and service measures. Some of the measures used here may prove to be adequate for some purposes or may help to point the way to much needed operational definitions for use in cost-service comparisons.

The patterns found in this study, e.g., for some areas, a decrease in unit costs as enrollment increases up to 1000 or 1100 and then an increase in unit costs accompanied by increases in services and resources -- may not hold for other cluster and non-cluster colleges. We also must determine what high unit costs mean -- are they 'good' or 'bad?'. They seem to have different meanings depending on the size of the college, i.e, they may reflect a low or a high level of services and resources. Certainly with the number of college mergers taking place today and the increase in the cluster type of operation, these questions must be answered.

APPENDIXES

In some cases data for the individual Claremont Colleges are shown. Where costs or services are the same for each college or where records are not separated by college, only the information for the Claremont Colleges as a group, is shown.

For all colleges, when data were unavailable and no reliable estimates could be made, the college or group in question was omitted from the comparison.

APPENDIX A

GENERAL INSTITUTIONAL DATA

1964-5, 1965-6, 1966-7 3 year average

College or Group	Enrollment[1]	Assets[2] (000)	Assets per Student	Endowment[3] (000)	Endowment per Student
CMC	631	14,801	23,456	5,332	8,451
MEN'S	750	20,352	27,136	11,980	15,973
HMC	281	9,141	32,531	1,059	3,770
ENGINEERING	1,023	19,177	18,746	11,619	11,358
POMONA	1,155	54,722	47,378	16,562	14,340
COED	1,253	30,203	24,104	12,639	10,087
SCRIPPS	389	13,132	33,759	7,102	18,257
WOMEN'S	885	19,474	22,005	7,960	8,994
CCS	3,343	123,116	36,828	42,632	12,752
DARTMOUTH	3,616	150,137	41,520	101,172	27,979

1 FTE undergraduate and graduate if any, fall term enrollments

2 Book Value

3 Includes, at book value, all funds functioning as endowment. Exludes life income contracts, annuities and other contractual arrangements where funds do not function as endowment

APPENDIX A

GENERAL INSTITUTIONAL DATA

1964-5, 1965-6, 1966-7 3 year average

College or Group	Total Expenditures[1] (000)	Total Expenditures per student	Educational & General Expenditures[2] (000)	Educational & General Expenditures per student	Tuition & Fees Income (000)	Tuition & Fees Income per student
CMC	2,168	3,436	1,376	2,181	969	1,535
MEN'S	2,549	3,399	1,805	2,407	1,135	1,514
HMC	1,678	5,972	1,364	4,856	423	1,506
ENGINEERING	2,256	2,205	2,075	2,028	1,043'	1,397'
POMONA	4,786	4,144	3,689	3,194	1,885	1,632
COED	4,575	3,738	2,915	2,326	2,003	1,598
SCRIPPS	1,778	4,573	1,116	2,870	590	1,518
WOMEN'S	3,256	3,679	2,052	2,319	1,434	1,621
CCS	13,872	4,149	10,125	3,028	5,012	1,499
DARTMOUTH	20,090	5,556	13,011	3,598	6,546	1,810

' = one college only

1 Excludes all research funds

2 Includes instruction, library, administration, general and plant maintenance expenses. All sponsored and organized research was deleted. Expense of maintaining non-educational property was deleted. No allocation of adminstration, general or plant expense was made to dormitories or other auxiliary enterprises.

APPENDIX A

GENERAL INSTITUTIONAL DATA

	Selectivity *	AAUP Index Grade of Average Faculty Compensation 1964-5 Rating	1965-6 Rating	1966-7 Rating
CMC	2	B	B	B
Hamilton	2	B	C	B
Haverford	1	B	B	B
Kenyon	2	C	C	C
Wabash	3	C	C	C
Washington & Jeff.	3	C	C	C
HMC	2	B	B	B
Cooper Union	2	C	C	C
Rose Polytechnic	3	C	C	C
POMONA	1	B	B	B
Colorado	3	C	C	C
Knox	3	B	A	A
Occidental	2	B	B	B
Reed	1	B	C	C
Swarthmore	1	B	A	A
SCRIPPS	3	B	B	B
Barnard	1	B	B	B
Bennington	3	N/A	N/A	N/A
Chatham	3	B	B	B
Goucher	2	B	B	B
Mills	3	B	B	B
CLAREMONT COLLEGES	see individual colleges			
Dartmouth	1	N/A	B**	B**

* 1 = most, 2 = highly, 3 = very
Comparative guide to American colleges, Cass, J. & Birnbaum, M. Harper & Row, 1966

** AAUP estimate

APPENDIX B

SUMMARY DATA OF AREAS STUDIED

1964-5, 1965-6, 1966-7 3 year average

LIBRARY

College or Group	Cost of Operation	Cost of Operation per Student	Number of Volumes Owned[1]	Number of Volumes Owned per Student	Number of Volumes Circulated	Number of Volumes Circulated per Student
CMC	41,631	65.98				
MEN'S	92,400	123.20	190,458	254	22,791*	28*
HMC	24,634	87.67				
ENGINEERING	67,167	65.66	66,045	65	29,410	29
POMONA	94,187	81.55				
COED	132,569	105.80	206,940	165	76,434	61
SCRIPPS	60,062	154.40				
WOMEN'S	74,349	84.01	96,820	109	38,206*	55*
CCS	325,632	97.41	448,277	134	128,053	38
DARTMOUTH	809,069	223.75	660,667	183	163,881	45

* = Data for 4 colleges only

1 Includes books, micro units, bound journals and serials; excludes all documents

APPENDIX B

SUMMARY DATA OF AREAS STUDIED

1964-5, 1965-6, 1966-7 3 year average

LIBRARY

College or Group	Expenditures for Books	Expenditures for Books per Student	Interlibrary Loans	Interlibrary Loans per Student	Hours Open per Year
MEN'S	30,871	41.16	536*	.73*	4,551"
ENGINEERING	18,900	18.48	50'	.07'	2,762'
COED	56,659	45.22	397*	.30*	4,682*
WOMEN'S	31,357	35.43	88*	.13*	4,031*
CCS	195,630	58.52	663	.20	3,856
DARTMOUTH	278,023	76.89	4,296	1.19	4,164

' = Data for 1 college only
" = Data for 2 colleges only
* = Data for 4 colleges only

APPENDIX B

SUMMARY DATA OF AREAS STUDIED

1964-5, 1965-6, 1966-7 3 year average

BUSINESS OFFICE

College or Group	Cost of Operation	Cost of Operation per Student	Dollars Handled (000)	Dollars Handled per Student	Cost per Thousand Dollars Handled
CMC	38,969	61.76	23,271	36,880	1.67
MEN'S	67,575	90.10	36,018	48,023	1.88
HMC	20,297	72.23	12,303	43,781	1.65
ENGINEERING	71,125	69.53	33,575	32,821	2.12
POMONA	124,854	108.10	77,957	67,495	1.60
COED	85,098	67.92	49,421	39,442	1.72
SCRIPPS	30,294	77.88	22,604	58,108	1.34
WOMEN'S	74,306	83.96	32,088	36,301	2.31
CCS	271,295	81.15	184,634	55,230	1.47
DARTMOUTH	468,013	129.43	277,946	76,866	1.68

APPENDIX B

SUMMARY DATA OF AREAS STUDIED

1964-5, 1965-6, 1966-7 3 year average

HEALTH SERVICES

College or Group	Cost	Cost per Student	Number of Visits	Cost per Visit	Visits per Student	Hours Doctor on Duty	Hours Doctor on Duty per Student
MEN'S	29,020	38.69	4,082*	7.11*	5.4 *	536*	.71*
ENGINEERING	19,333'	25.88'	912'	21.19'	1.2'	180'	.18'
COED	37,083	29.60	7,834*	4.73*	6.3*	307	.25
WOMEN'S	35,431	40.04	4,175**	8.49**	5.2**	844*	.95*
CCS	105,115	35.33	14,502	6.46	4.9	2,688	.90

' = Data for 1 college only
** = Data for 3 colleges only
* = Data for 4 colleges only

APPENDIX B

SUMMARY DATA OF AREAS STUDIED

1964-5, 1965-6, 1966-7 3 year average

PSYCHOLOGICAL CLINIC

College or Group	Cost	Cost per Student	Number of Hours Doctor on Duty per Student
MEN'S	12,000'	23.00'	1.24'
ENGINEERING	16,800'	22.49'	2.84'
COED	11,092	8.85	.97**
WOMEN'S	9,885**	11.07**	N/A
CCS	36,052	10.78	.68
DARTMOUTH	52,623	14.55	.76

' = Data for 1 college only
** = Data for 3 colleges only

APPENDIX B

SUMMARY DATA OF AREAS STUDIED

1964-5, 1965-6, 1966-7 3 year average

MAINTENANCE

College or Group	Cost	Cost per Student
CMC	183,511	290.83
MEN'S	264,735	352.98
HMC	118,962	423.35
ENGINEERING	255,829	250.08
POMONA	474,182	410.55
COED	406,948	324.79
SCRIPPS	183,220	471.00
WOMEN'S	276,516	312.45
CCS	1,142,578	341.78
DARTMOUTH	1,522,033	420.92